

REMARKS

In the Office Action mailed November 5, 2003, the presently pending application is currently objected to for various alleged informalities. The information disclosure statement filed on August 16, 2000 allegedly failed to comply with 37 CFR § 1.98(a)(2). In addition, currently pending claims 7, 10, and 13 stand objected to because of several informalities. Claim 3 stands rejected under 35 U.S.C. 112, second paragraph and claims 1-16 stand rejected to under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,434,110 to Hemkumar ("Hemkumar '110").

After a careful review of the currently pending claims and the Hemkumar '110 reference, Applicants respectfully request reconsideration of the pending rejections in view of the following remarks and clarifications.

I. INFORMATION DISCLOSURE STATEMENT

Applicants' previously filed Information Disclosure Statement has been objected to for allegedly failing to comply with 37 CFR § 1.98(a)(2). In a telephone discussion on February 10, 2004 with Examiner Nguyen, upon further review of the case file, Examiner Nguyen withdrew this objection. Examiner Nguyen concluded that the cited references would not need to be resubmitted and that all of the previously filed references would be considered. Applicants therefore respectfully request that this objection be withdrawn.

II. OBJECTION TO APPLICANTS' SPECIFICATION

The Specification has been objected to for various alleged informalities. Applicant has amended the Specification to correct these alleged informalities.

III. CLAIM OBJECTIONS

Claims 7, 10, and 13 stand objected to because of various alleged informalities.

Corrections have been made to overcome these formalities.

IV. CLAIM REJECTIONS UNDER 35 U.S.C. § 112

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Again, corrections have been made to overcome these formalities.

V. CLAIM REJECTIONS UNDER 35 U.S.C. § 102(e)

Claims 1-16 stand rejected to under 35 U.S.C. 102(e) as being anticipated by United States Patent No. 6,434,110 (“Hemkumar ‘110”). Applicants respectively traverse.

A. Applicants’ Presently Claimed Invention

Applicants’ presently claimed invention generally relates to echo cancellers that distinguish speech signals from other types of communication signals and echo cancellers that are enabled based upon the type of communication signal received from an outside source. (Applicants’ Specification p. 2, lines 3 – 6).

As Applicants describe, in telecommunication networks, a subscriber device is connected to other subscriber devices using various connection techniques. For example, over short distances, two-wire lines may be employed. For longer distances, four-wire lines may be used. In addition, hybrid circuits are used to connect two-wire lines to four-wire lines.

Voice messages are transmitted through the network. For instance, if the subscriber device is a telephone, a voice message may be transmitted from a telephone, over a two-wire line to a first hybrid circuit, and then over a four-wire line to a second hybrid circuit. The second hybrid circuit may be connected to a second subscriber device.

In addition to voice messages, telecommunication networks also transmit data signals. Many of the data signals are narrow-band. For example, narrow-band data signals generated by

V.21 modems are transmitted over telecommunication networks. Although some data signals can not be classified as narrow-band signals, these signals are modulated, and, therefore, their energy centers around a carrier frequency. (Applicants' Specification p. 2, lines 9 – 21).

The currently pending claims are generally directed to an echo canceller disabler for modulated data signals. Indeed, this is the title of Applicants' present invention. The system and method determine whether far and near-end signals are predetermined types of signals, such as modulated signals used to transmit data. The invention then ascertains further information concerning the near and far-end signals and determines whether to freeze the adaptation of the echo canceller or bypass the echo canceller based upon this information. (Applicants' Specification p. 2, lines 3 – 6).

Applicants describe the operation of such a system in Figure 2. As illustrated in Figure 2, at step 202, the system determines the nature of the near and far-end signals. In other words, the system determines whether the signals (far-end and near-end) are of a certain type, such as, modulated data signals. At step 204, the system uses the results at step 202 to make a branching decision. For example, if data was detected at step 202, then control proceeds to step 206. If data was detected, that is, at least one of the signals represents a data signal, then at step 206, the system determines whether the adaptive filter converges. Step 206 may have already been determined earlier. For example, a training signal is supplied before data signal transmission and the adaptive filter converges to the true echo path by the training. If the answer at step 206 is affirmative, then control continues at step 210 where adaptation is frozen. If the answer is negative, control continues at step 212 where the echo canceller is disabled. (Applicants' Specifiaciaton at p. 19 lines 11 – 21).

The presently pending Independent Claims 1, 6, 7, 12, and 13 are directed to such a

method and system. For example, Independent Claim 1 expressly recites the steps of “determining whether said far-end signal is representative of a modulated signal,” “determining whether said near-end signal is representative of a modulated signal,” and “controlling the operation of said echo canceller in response to . . . said steps of determining whether said far-end and near-end signals are modulated signals.”

The remaining Independent Claims 6, 7, 12, 13 recite similar limitations. For example, Independent Claim 6 expressly recites “determining whether said far-end signal is representative of a modulated signal,” “determining whether said near-end signal is representative of a modulated signal,” “controlling the operation of said echo canceller in response to . . . said steps of determining whether said far-end and near-end signals are data.” Independent Claim 7 expressly recites a “determination means . . . for determining characteristics of said near-end and far-end signals, and a “control means . . . [that] adjusts the operation of said adaptive filter based upon said characteristics of said near and far-end signals.”

Independent Claim 12 expressly recites a “determination means . . . for determining whether said near-end and far-end signals are not speech signals,” and a “control means . . . [that] adjusts the operation of said adaptive filter based upon the characteristics of said near and far end signals.” And Independent Claim 13 recites a “means for determining whether said near and far end signals have predetermined characteristics,” and a “means for sending a control signal to control the operation of an echo canceller based upon said determination of whether said near and far end signals have predetermined characteristics and said operating characteristics.”

B. Hemkumar ‘110 Does Not Teach or Suggest Determining Whether A Near-End Or Far-End Signal Is A Modulated Signal

Claims 1-16 stand rejected to under 35 U.S.C. 102(e) as being anticipated by (United States Patent No. 6,434,110 (“Hemkumar ‘110”). Applicants respectively traverse.

Applicants respectively submit that Hemkumar '110 does not disclose the steps of "determining whether said far-end signal is representative of a modulated signal" or "determining whether said near-end signal is representative of a modulated signal" as expressly recited in Independent Claim 1. Naturally, therefore, Hemkumar '110 also fails to disclose the step of "controlling the operation of said echo canceller in response to . . . said steps of determining whether said far-end and near-end signals are modulated signals."

Rather, Hemkumar '110 appears generally directed to a full-duplex speakerphone control circuit including a double talk detector that operates with an echo canceller. The double-talk detector also includes a power estimator and noise estimator for determining a noise level. Filter coefficients of the echo canceller are updated or updating is blocked based on several considerations including a comparison of ERLE value to best ERLE value, the noise level in comparison to the benchmark noise level, whether the circuit is operating in half-duplex or full-duplex mode, and detection to a tone. (Hemkumar '110 Abstract).

Hemkumar '110 describes the full-duplex speakerphone integrated circuit as a complete system implementation of a digital signal processor (DSP) with RAM 116 and program ROM 118. The DSP 114 executes acoustic processing routines such as adaptive filtering, half duplex switching digital volume control, echo cancellation. (Hemkumar '110 Col. 3 line 66 to Col 4 lines 5).

The Office Action relies on various portions of the Hemkumar '110 reference as disclosing Applicants' steps of determining whether the near end and far-end signal is representative of a modulated signal and then controlling the operation of the echo canceller in response to determining whether the far-end and near-end signals are modulated signals. (November 5, 2003 Office Action at pp. 4, 7, and 10. However, the cited portions of Hemkumar

‘110 merely discuss what appear as steps for determining power estimates used for echo suppression.

The Office Action relies in part on Hemkumar ‘110 Col. 5, line 24-26 as teaching Applicants’ determination step. But this cited portion of Hemkumar ‘110 appears to merely discuss establishing a power estimate used for echo suppression. For example, at Col. 5 lines 24-26, Hemkumar ‘110 states “[t]he signal generated by the network input high pass filter 126 is processed to determine a parameter, called the far-end input power fe_in_pow, this is used for suppression.” (emphasis added). Furthermore, at Col. 5 lines 43 -45, Hemkumar ‘110 states that “[t]he far-end input power fe_in_pow is the power estimate of the far-en input signal prior to the NEC summing node 130.” (Hemkumar ‘110 Col. 5 , lines 43 – 45). There is simply no teaching or suggestion here as to determining whether a far-end signal is a modulated signal.

Furthermore, at Column 5, lines 32-35, Hemkumar ‘110 discusses generating a power signal that is used for suppression. Hemkumar ‘110 explains that the signal generated by a network input high pass filter 126 “is processed to determine a parameter, called the far end input power fe_in_pow, that is used in suppression. (emphasis added) These cited portions of Hemkumar ‘110 make no reference as to determining whether a far end and a near end signal are modulated and therefore also fails to mention controlling an echo canceller based on such a determination.

And at Col 6 lines 24 – 27, Hemkumar ‘110 discusses that the signal generated by the acoustic input high pass filter 158 is processed to determine a parameter, called the near-end power ne_in_power. At Col. 6 lines 35 – 37, Humkumar ’110 explains that the ne_in_pow is the power estimate of the near end input signal prior to the EAEC summing node 160. Again, the ne_in_pow parameter is merely used in “suppression,” and not used in any manner to determine

whether a near end signal is "modulated."

And finally, at Col. 11, lines 46 – 48, Hemkumar '110 merely discusses that a "speech event" is detected when a power estimated level rises above a background noise level defined by a defined threshold. Again, this cited portion of Hemkumar '110 makes no reference to determining whether the near-end and far-end signals are modulated signals and then controlling an echo canceller based on this determination.

To anticipate a claim, "each and every element set forth in the claim [must be] found, either expressly or inherently described, in a single . . . reference." *Vergall Bros. V. Union Oil Co. of California*, 814 F.2f 628, 631 (Fed. Cir. 1987) (M.P.E.P. Section 2131). Consequently, since Hemkumar '110 does not teach or suggest "determining whether said far-end signal is representative of a modulated signal" or "determining whether said near-end signal is representative of a modulated signal," Hemkumar '110 simply also does not teach or suggest "controlling the operation of said echo canceller in response to . . . said steps of determining whether said far-end and near-end signals are modulated signals." Hemkumar '110 therefore does not teach every element of the claimed invention and, therefore does not anticipate Independent Claims 1, 6, 7, 12, and 13.

Consequently, Independent Claims 1, 6, 7, 12, and 13 are allowable for at least all of the reasons stated above. The remaining claims 2-5, 8-11, and 14 - 16, are all dependent on these allowable independent claims and are therefore allowable for at least the reasons states above.

VI. SUMMARY

In view of the remarks above, Applicants' respectfully submit that the present application is in condition for allowance and solicits action to that end. If there are any additional matters that may be resolved or clarified through a telephone interview, the Examiner is respectfully

requested to contact Applicant's undersigned representative.

Respectfully submitted,

McDonnell Boehnen Hulbert & Berghoff

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By:


Thomas E. Wettermann
Reg. No. 41,523